

POLLEN COUNTING

Purpose This Meteorology and Air Quality Group (MAQ) procedure describes the process to collect, analyze, and report the pollen concentration counts collected with the Rotorod pollen counter located at TA-54.

Scope This procedure applies to the MAQ personnel assigned to operate the Rotorod pollen counter located at TA-54.

In this procedure This procedure addresses the following major topics:

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General information about this procedure

Attachments This procedure has the following attachments:

Number	Attachment Title	No. of pages
1	Hazard Review	1

History of revision

This table lists the revision history and effective dates of this procedure.

Revision	Date	Description Of Changes
0	4/21/00	New document.
1	12/22/04	Quick-change revision to replace HCP with HR.

Who requires training to this procedure?

The following personnel require training before implementing this procedure:

- Personnel changing sampling rods
- Personnel identifying and counting pollen

Annual retraining is required and will be by on-the-job training.

Personnel previously trained to revision 0 of this procedure do not require re-training to this revision.

Training method

The training method for this procedure is **on-the-job** training and is documented in accordance with the procedure for training (MAQ-024).

Prerequisites

In addition to training to this procedure, the following training is also required prior to performing this procedure:

For those removing and changing sample rods only (through step 6 on page 4)

- First Aid and Cardiopulmonary Resuscitation (CPR)

For those identifying and counting pollen (steps 7 through 14 on page 4)

- Course in pollen counting

References

The following documents are referenced in this procedure:

- MAQ-024, "Personnel Training"

Pollen counting with the Rotorod pollen sampler

Description of Rotorod pollen sampler	The Rotorod sampler is a rotation-impaction device used to collect airborne pollen. Two polystyrene rods (1 ¼" long and 1/16" wide) are coated on one side with silicone grease. When the sampler operates, the rods swing out due to centrifugal force and are exposed to ambient air.
Frequency of pollen counts	A pollen count is normally performed thrice per week, but this may be changed at the discretion of the AIRNET project leader. At some times of the year, the pollen counting may be discontinued due to low pollen.
Standard conditions to obtain pollen count	Rotation speed: 2400 rpm Sampling time: 24 hours (1440 minutes) Sampling percentage: 10% (1 minute every 10 minutes) Area of rod counted: entire rod under 1 cover slip Volume of air sampled under standard conditions: one rod will sample 3.12 m ³ of air
Equation for pollen count	<p>The standard equation to calculate a pollen count is:</p> N / V <p>Where:</p> <p>N = number of pollen grains counted per rod over 24-hour sampling period;</p> <p>V = volume of air sampled, in m³ (normally 3.12m³)</p> <p>Counting the grains on a rod refers to the area on the rod under one cover slip.</p>
Changing the sampling time	If the sampling time varies from 1440 minutes, divide the new time (in minutes) by 1440 [24 hours = 1440 minutes] and multiply that number by 3.12 m ³ to get the new volume of air sampled.
Changing the area of the rod counted	The area of the rod counted may be decreased if the pollen counts are high. 400 grains are considered sufficient to obtain an accurate pollen count. If this approach is used, estimate the portion of the rod counted. For example, if 23% of the rod is counted, decrease the volume of air sampled to 23% of 3.12 m ³ .

Pollen counting with the Rotorod pollen sampler, continued

Steps to collect a pollen sample

To collect a pollen sample, perform the following steps:

Step	Action
1	Mark 2 rods with a permanent marker on the proximal ends and on the sides of the rods to be exposed. The metal arm which retracts the rods is marked indicating the direction of rotation.
2	Grease two rods <i>lightly</i> with silicone grease.
3	Using forceps and grasping the rod on the non-greased sides, insert the rods into the rod holders in the metal arm and secure the rods with the thumb screws.
4	Ensure the thumb screw holding the metal arm to the sampler is tight.
5	Place the sampler on the extension pole at the sampling site and make the appropriate connections to the timer. Raise the pole to its maximum extension.
6	Flip the timer on and note the time.
7	Twenty-four hours later, lower the pole, remove the sampler, and remove the rods (with forceps).
8	Place the rods in the grooved stage adapter with the greased side up.
9	Apply Calberla's stain and place the cover slip on the rod.
10	Allow stain to uptake for 5 minutes.
11	Using the binocular microscope, count and identify pollen grains at 400x.
12	Note the number of grains by type. Record the counts on the pollen data sheet (supplied by MultiData, Inc.).
13	Consider any adjustments or corrections to the data, as described in the blocks above, and calculate the total pollen count according to the equation given above.
14	Enter the data in a spreadsheet and email it to the office of Allergy and Asthma Associates in Los Alamos, or other location as requested.

Calibrating the sampler

Get the sampler spin rate (2400 rpm) calibrated annually by Sampling Technologies. Contact Multidata at 612-285-9887.

Records resulting from this procedure

Records

The following records generated as a result of this procedure are to be submitted **annually** as records to the records coordinator:

- Calibration certification for the Rotorod

HAZARD REVIEW

Work tasks/Steps	Hazards, Concerns, and Potential accidents; Likelihood/ Severity	Controls, Preventive Measures (e.g., safety equipment, administrative controls, etc.)	Hazard Level from IMP 300-00-00 Hazard Grading Matrix
Handle glass slides as part of pollen counting, described in this procedure.	Potential cuts if slide breaks when handling it. negligible/remote = minimal	Use caution and care when handling glass.	Low
Use binocular microscope to count pollen grains as described in chapter "Pollen counting with the Rotorod pollen sampler" in this procedure.	Eye strain from continuous use. Moderate / occasional = low	Take breaks frequently, don't work for more than an hour continuously.	Low

Wastes or residual materials resulting from process

None.

Emergency actions to take in event of control failure

For all injuries, provide first aid and see that injured person is taken to Occupational Medicine (only if immediate medical attention is not required) or the hospital. Follow all site-specific emergency plans for any radiation or explosives emergencies.

